

A REVIEW OF THE GENUS *STOMATOTHRIPS* HOOD

(Thysanoptera: Aeolothripidae)

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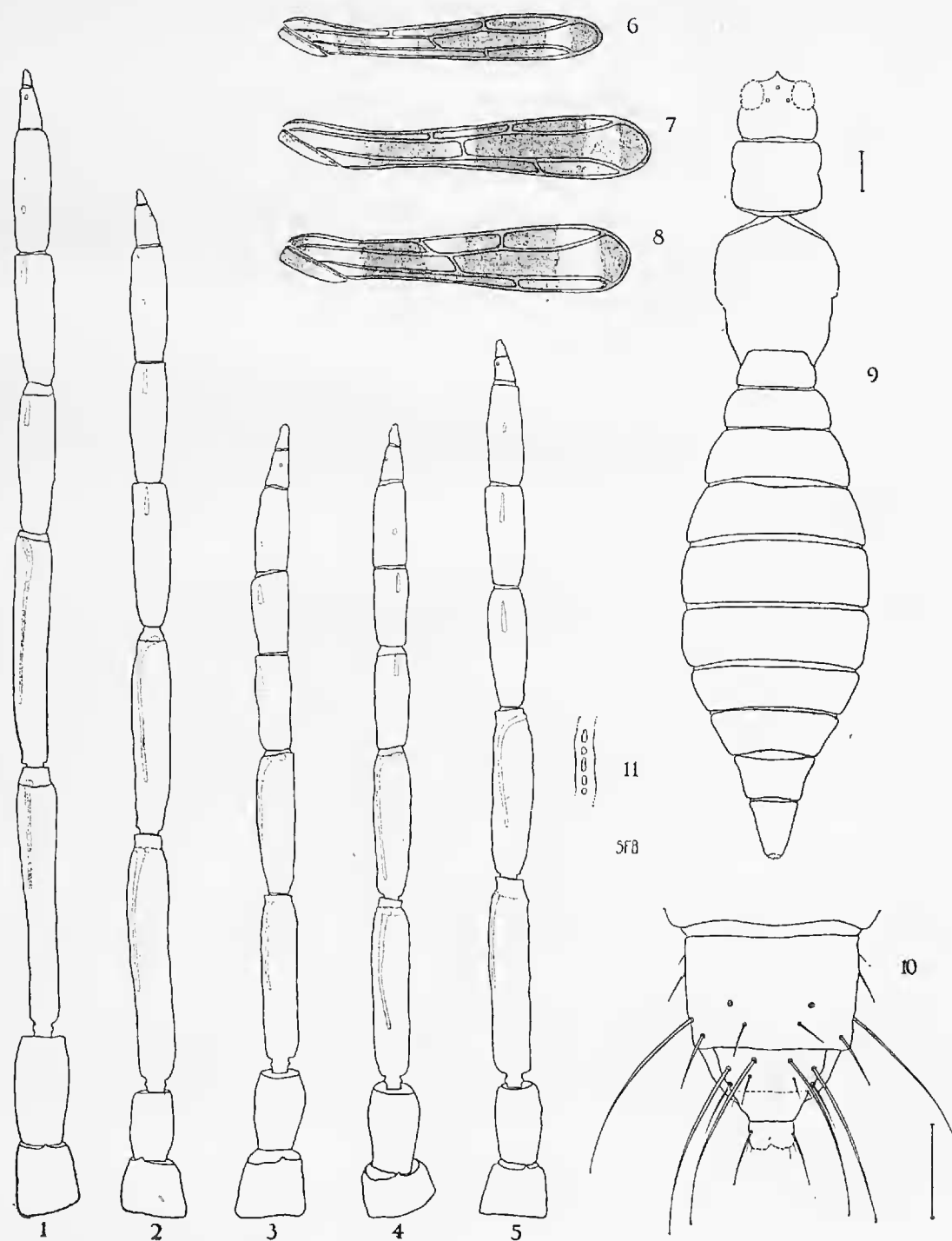
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This small genus of the order Thysanoptera, like most others in North America, is in need of being redescribed and brought up to date. In 1912 Hood described *Stomatothrips* and designated the only species known, *flavus* Hood, as the genotype. Since that time five additional species have been characterized which gives a much broader base on which to set apart this aeolothripid group.<sup>1</sup> Originally it was compared properly with *Orothrips* and *Erythrothrips* Moulton. However, among the species of *Stomatothrips* it is now apparent that the number of segments of the maxillary palpus varies somewhat, but less so than in *Erythrothrips* (Bailey, 1947). Therefore, it is no longer possible to clearly separate these genera (and all species therein) on the basis of this character alone (Bagnall, 1932, Watson, 1923). The genus now can be redescribed to include the characters the known species have in common.

It, no doubt, is presumptuous to attempt to prepare a taxonomic review of a group of insects without having seen any of the types! However, based on the study of five paratypes (three females and two males) of *flavus*, on 52 specimens of *brunneus* (det. Bailey) some of which have been compared with the unique type of *brunneus* by Miss Kellie O'Neill, and two specimens of *septenarius*, one from Trinidad (coll. C. B. Williams, March 29, 1915) and one from Honduras, it is now possible to establish several good reference points to aid present and future thysanopterists in identification and revisional work. In this genus, species are separated by the relative size of wings and antennae and the degree of coloration, which characters are not always constant. Such reliance on color variations particularly is most undesirable but is necessary in this genus until longer series of specimens are taken or the types made available and better anatomical characters discovered.

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<sup>1</sup>This study is based on 119 specimens representing four species of this uncommon genus. The writer is indebted to Mr. C. F. W. Muesebeck and Miss Kellie O'Neill of the Division of Insect Identification, U.S.D.A., Prof. A. N. Tissot, Univ. of Florida, Dr. C. B. Williams, Rothamsted Experiment Station, England, Dr. H. Priesner, Ministry of Agriculture, Cairo, Egypt, K. Sakimura, Honolulu, Dean Floyd Andre, Iowa State College, L. J. Stannard, Illinois Nat. Hist. Survey, and the Canadian National Museum, Ottawa, for loans and gifts of specimens.



## EXPLANATION OF FIGURES

Fig. 1. Antenna of *Stomatothrips flavus* Hood, female. Fig. 2. Antenna of *Stomatothrips flavus* Hood, paratype male. Fig. 3. Antenna of *Stomatothrips brunneus* J. C. Cwfd., female. Fig. 4. Antenna of *Stomatothrips brunneus* J. C. Cwfd., male. Fig. 5. Antenna of *Stomatothrips septenarius* Hood, female. Fig. 6. Forewing of *Stomatothrips septenarius* Hood. Fig. 7. Forewing of *Stomatothrips flavus* Hood, female. Fig. 8. Forewing of *Stomatothrips brunneus* J. C. Cwfd., female. Fig. 9. Body outline of *Stomatothrips flavus* Hood, female. Fig. 10. Terminal abdominal segments of *Stomatothrips flavus* Hood, male (dorsal). Fig. 11. Enlarged section of sensory area (not to scale). Scale: Figs. 1, 2, 3, 4, 5, line equals 0.01 mm.; Figs. 6, 7, 8, 9, line equals 0.10 mm.; Fig. 10 line equals 0.10 mm.

In comparison with other related genera, *Stomatothrips* is rather rare in collections. On the other hand, the distribution of the species in North America is much greater than *Ankothrips*, *Orothrips*, or *Erythrothrips*. At present, *Stomatothrips flavus* is known to occur from Arizona to Georgia and from North Dakota to Mexico, *brunneus* is restricted to the southwest, and *atratus* is known only from Texas. The remaining species are tropical.

Practically nothing is known of the biology of this group but they are undoubtedly predaceous. The wide variety of hosts from which they have been collected such as cotton, peach, grass, alfalfa, grape, yucca, and so on, indicates strongly this type of habit. The collection of several specimens from peach orchard soil (Crawford, 1940) by federal entomologists clearly indicates that pupation takes place in the ground. To our knowledge, larvae of *Stomatothrips* have not been identified. Based on our studies of related genera, we can conclude that the mature larva drops to the soil (or cover) beneath the hosts and forms a loose cocoon. Like *Franklinothrips*, this group of thrips is not sufficiently abundant in North America to be of any value in controlling injurious insects and mites.

#### STOMATOTHRIPS HOOD, 1912

Head about as wide as long, not noticeably projected beyond eyes, broadly attached to thorax as in *Franklinothrips*. Compound eyes not produced or only slightly prolonged ventrally. Antennae nine-segmented, the distal segment very small and closely attached to the eighth, long and slender and somewhat differently proportioned in the sexes, similar in general appearance to *Erythrothrips* and not as thread-like as in *Franklinothrips*. Sensory areas on the antennal segments as follows: On III, narrow, linear and ventral, with central row of dots; on IV, narrow, ventral and hooked at tip on underside, curving inward (as in *Desmothrips*), also with central row of dots; on V and VI, cuneiform; on VII, variable, linear to oval. Maxillary palpi geniculate, 7 to 8 segmented, sometimes fused near tip. Labial palpi five-segmented. Pronotum without strong spines. Fore tarsus with hook-like appendage. Wings distinctly expanded at tip and narrowed in second eighth (as in *Allelothrips* Bagnall) with two white cross bands, one sub-apical and the other in basal fourth. Two longitudinal veins in fore wing, with the usual cross-veins. Abdomen broadly expanded at segments IV to VII, with a narrow "waist" and sharply pointed at tip, as in *Franklinothrips*. Ovipositor upturned. Male small and slender without genital claspers, as in *Erythrothrips*. First abdominal segment elongate and divided into thirds by longitudinal ridges as in related genera. Antennal segments differently proportioned, segment VII usually longer than in female.

Genotype—*Stomatothrips flavus* Hood, 1912. By original designation. See also Priesner, 1949, p. 149.

## STOMATOTHRIPS ANGUSTIPENNIS HOOD, 1949

1949. HOOD, J. D. Rev. de Ent. 20(1-3):12-14, fig. 9.

This species is known only from the original Brazilian material. It should be noted that this species has a micropterous form. The 7-segmented maxillary palps, the longer head, and the light-colored antennal segment IV separate it from related species.

## STOMATOTHRIPS ATRATUS HOOD, 1939

1939. HOOD, J. D. Rev. de Ent. 10(3):550-551.

1949. BAILEY, S. F. Fla. Ent. 32(1):24.

This species was described from two females taken on a host thought to be *Lycium berlandieri* at San Antonio, Texas, March 22, 1939. There have been no published records of it since.

Male. Body dark brown. Legs concolorous with body. Wings marked as in original description of female, i.e., no pale spot in center of dark band. Antennal segments I and II dark brown; III yellowish brown, darker at tip, remaining segments dark brown, IV with light ring just above base. Sensory areas on antennae normal. Genitalia without claspers. Maxillary palpi seven-segmented, the terminal segments considerably shortened and indicating fusion. Setae on dorsum of head and pronotum small, scattered, and similar in size.

Described from one specimen from Winter Haven, Texas, taken by K. Sakimura (Collection 3507), October 3, 1948, ex. *Lycium berlandieri*. The slide is in the writer's collection.

## STOMATOTHRIPS BRUNNEUS J. C. CRAWFORD, 1940

1940. CRAWFORD, J. C. Proc. Ent. Soc. Wash. 42(2):45.

1948. BAILEY, S. F. Fla. Ent. 31(2): 39, 41.

Female. Dark brown, often with red sub-hypodermal pigment rarely extending into legs, wings and antennae. Abdomen with segment II and X light brown. Legs dark brown with middle and hind femur usually lighter than tibiae.

Head wider than long, faintly striated, cheeks not strongly arched. Eyes not protruding and only slightly prolonged ventrally, post-ocular setae scattered, not strong, the largest being directly behind the posterior ocellus (and these are variable). Maxillary palpi 8-segmented. Antennal segments I and II brown, III yellowish brown distally, IV yellow, usually with a circle of brown at tip, V brown at tip with various degrees of shading to yellow base, VI-IX dark brown. Sensory areas: on III linear, slightly curved at tip and extending over half the length of segment, IV recurved at tip, partly encircling the segment and extending two-thirds its length, on V and VI cuneiform and near distal end, on VII and VIII small and oval (see fig. 3).

Forewing very similar to that of *flavus* but usually slightly larger (see fig. 8). Fore vein with 18 to 25 setae, hind vein with 14 to 20, cross bands as in *flavus*. Hind wing faintly pigmented with grey in a similar pattern to that of forewing.



Legs brown, in dark specimens uniformly so but in teneral specimens with the femora mottled or yellow. The usual claw present on fore tarsi. Scattered small setae on entire surface of pronotum, two slightly stronger bristles near center of posterior margin. Shape of body as in fig. 9.

Measurements (in mm.): Head, length, .162, width, .216; antennal segments, I, .038; II, .051; III, .124; IV, .076; V, .060; VI, .048; VII, .048; VIII, .022; IX, .012. Pronotum: length, .202; width, .229. Forewing: length, .91; width at narrowest portion, .094, at widest portion .22 or 2.3 times width at narrowest point. Total body length, 1.97 (expanded).

Redescribed from a series of specimens from Texas, Iowa, Arizona, New Mexico, and Oklahoma. The above description takes into account color variations and the measurements are average figures for 25 specimens. Some individual specimens have very short antennae but vary in no other way.

Male. Color as in female. Abdomen slender and having the general appearance of an *Erythrothrips*. Genitalia without claspers as in *flavus* (see fig. 10). Antennae long and slender, bicolorous, segments I and II yellowish brown, II yellow at tip, III yellowish brown, IV-IX brown. Sensory areas as in *flavus* (see fig. 4). Wings smaller and more slender.

Measurements (in mm.): Antennal segments, length, I, .032; II, .044; III, .115; IV, .089; V, .060; VI, .048; VII, .041; VIII, .016; IX, .011. Head: length, .155. Pronotum: length, .162. Forewing: length, .75; width at narrowest portion, .067; at widest portion, .112. Total body length, 1.5.

The male is described from a specimen with the following data: "Cover sweeping. Phoenix, Ariz., July 9, 1937. L. D. Christenson. C-25-58. Lot 37.25836." The slide is the property of the Federal Bureau of Entomology and Plant Quarantine, Washington, D.C.

This species appears to be more variable than any other studied. In the future *brunneus* will probably be found to be more than one species.

#### STOMATOTHRIPS FLAVUS HOOD, 1912

1912. HOOD, J. D. Proc. Biol. Soc. Wash. 25:63-66, fig. 1.

1923. WATSON, J. R. Univ. Fla. Agr. Exp. Sta. Bull. 168:8, 25.

1949. BAILEY, S. F. Fla. Ent. 32(1):24.

The genotype may have been based upon what we now consider two species, *flavus* and *brunneus*. Of the five paratypes we have examined, two (one male and one female) have the shorter antennae, stronger post-ocellar setae, and somewhat larger wings which characterize *brunneus*. An examination of the holotype will be necessary to clearly establish the possible synonymy of *brunneus* and, if such is the case, a new name for the form with the long antennae which we have previously known as typical "*flavus*" will be necessary. Eventually, when a large series of specimens has been accumu-

lated throughout its range, a new species, intermediate between *flavus* and *brunneus*, may be justified.

It is desirable to supplement the original description with several characters which are now necessary to be known in order to key out the species.

The setae on the dorsum of the head are all about the same size, scattered and without a definite pattern. Eyes not prominent but slightly prolonged posteriorly. Sensory area on antennal segment III linear, variable in length, ventral, usually extending more than half the length of segment, expanded at tip and with minute, irregular, clear, circular areas in central portion (see figs. 1 and 11); a similar area on segment IV but curved at tip, and extending about three-fourths the length of the segment. One or two small, oval sensory areas on VII from which arise a cone. Segment IV yellow, usually with a very narrow brown ring at tip. Ovipositor upcurved. Male with dark greyish brown antenna (fig. 2) with the segments differently proportioned. Genitalia similar to *Erythrothrips*, without claspers (see fig. 10).

A micropterous form is now known from Illinois. It varies from the typical individuals only in the size of the wings which are 0.67–0.74 mm. long.

#### STOMATOTHRIPS SEPTENARIUS HOOD, 1925

1925. HOOD, J. D. Psyche 32(1):48-49.

1949. BAILEY, S. F. Fla. Ent. 32(1):24.

The single female specimen kindly made available by Dr. C. B. Williams, the collector, has the following data appended: "Trinidad, B.W.I., March 29, 1915. St. Joseph. No. 621. Swept from grass." The forewing and antenna have been illustrated for convenience (figs. 5 and 6) and the original description supplemented as follows:

Head brown, anterior portion yellowish brown. Ocelli with crimson crescents of pigment normal. Eyes not prominent, very slightly prolonged ventrally. Inter-ocular and post-ocular setae very moderate and without a characteristic pattern. Cheeks slightly swollen, with very faint reticulation. Maxillary palpi 7-segmented. Antennal segments I and II yellowish brown, III pale yellow to white with dark brown ring of pigment at tip, IV-IX dark brown, IV lighter in basal portion. Sensory areas as in *flavus* with that on segment IV strongly curved at tip (see fig. 5).

Forewing smoky brown with two white cross-bands, one in basal fourth and one in distal fourth, with an indistinct lighter area near center. The ring

vein is pigmented throughout its distal portion (see fig. 6). Fore veins of forewing with 19 and 22 setae, hind veins with 13 setae each. Hind wing typical of the genus.

Legs brown, femora lighter than tibiae. The usual claw present on fore tarsi. Thoracic area brown with light orange tint. Abdomen brown with segments II and III lighter. Shape of body as in fig. 9. Setae on pronotum small, uniform in size and more or less uniformly placed over entire surface. Sub-hypodermal pigment in body orange rather than red.

Measurements (in mm.): Antennal segments, length: I, .028; II, .049; III, .128; IV, .102; V, .038; VI, .070; VII, .057; VIII, .019; IX, .012. Head, length, .147; width, .176. Pronotum, length, .169; width, .217. Forewing, length, .837; width at narrowest portion, .074, at widest portion, .121, or 1.6 times as wide as at narrowest point. Total body length, 1.63.

### STOMATOTHRIPS ROTUNDUS HOOD, 1949

1949. Hood, J. D. Rev. de Ent. 20(1-3):10-12, figs. 7, 8.

This South American species is known only from the original collection. It belongs in that segment of the genus having 7-segmented maxillary palps. From its relatives it is distinguished by the dark-colored antennal segment IV and the broader head.

It should be noted that the two species of *Stomatothrips* described from South America have been collected from *Panicum* as have also *flavus* and *brunneus* in Texas.

### A KEY TO STOMATOTHRIPS SPECIES

1. Maxillary palpi 8-segmented .....2  
    Maxillary palpi 7-segmented .....3
2. Antennal segment IV long and slender (.131-.147 mm. in female), usually pale yellow with brown ring at tip. Segment III yellow. Antennae of male very long and slender, all segments smoky brown. General body color yellow to light brown. (North America).....*flavus* Hood, 1912  
    Antennal segment IV much shorter (.080-.092 in female), shaded with dark grey or brown at tip usually with more pigmentation than narrow ring at tip. Antennae of male bicolorous, segments II and III light yellowish brown, I darker, IV-IX dark brown and much shorter. General color brown to dark brown with crimson sub-hypodermal pigment....  
    (North America) .....*brunneus* J. C. Crawford, 1940
3. Antennal segment IV white with black line around tip. Male unknown. (South America) .....*angustipennis* Hood, 1949  
    Antennal segment IV blackish brown.....4
4. Forewing narrow and not strongly expanded in distal third (fig. 6). Ring vein pigmented along entire costal margin distally. Anterior longitudinal vein of forewing with 19-22 setae. Male unknown. (Central America)  
    .....*septenarius* Hood, 1925

Forewing expanded distally, greatest width 1.6 to 1.7 times the least width .....5

5. Intermediate dark-colored portion of forewing without paler areas (as in figs. 6, 7, and 8). Antennal segments V and VI each with cuneiform sensory area; VII .041 mm. in length. (North America).....

.....*atratus*, Hood, 1939  
Intermediate dark-colored portion of forewing paler in basal third.

Antennal segments V and VI each with a linear sensory area; VII .059 mm. in length. (South America).....*rotundus* Hood, 1929

### CATALOG OF THE SPECIES OF STOMATOTHRIPS WITH NEW DISTRIBUTIONAL RECORDS

1. *angustipennis* Hood, 1949. South America: Brazil. Nova Teutonia, Santa Catharina, Jacarepagua, D. F., Campo Grande, R. J. Taken on grasses, *Panicum* sp., and dead branch. January, May, and June. Females only; both macropterous and micropterous.
2. *atratus* Hood, 1939. North America: San Antonio, Texas. *Lycium berlandieri*. March. Females only originally. New record: one male, October 3, 1948, at Winter Haven, Texas, ex *Lycium berlandieri* by K. Sakimura.
3. *brunneus* J. C. Crawford, 1940. North America: Lafayette County, Arkansas. Unique female "in peach orchard soil." October. New records: Monterey, Mexico, July 5, 1908. C. A. Hart. In sweeping from grass, etc. Intercepted in quarantine at El Paso, Texas. Other Texas records are from Bangs, Denison, Crystal City, Waco, and Winter Haven. Nogales, Phoenix, Patagonia, Sonoita and Sedona, Arizona. Mesilla, New Mexico. Calera, Oklahoma. Sioux City, Iowa. New hosts are: alfalfa, Bermuda grass, clover, cover crops, Johnson grass, grass, lettuce, *Panicum obtusum*, peach, yucca, and in soil. Collections have been from May through October.
4. *flavus* Hood, 1912. Genotype. North America: Monterey, Matamoras, and Tlahuailio, Mexico. Brownsville, Texas. Dubois and Odin, Illinois. Common on cotton, grass, and weeds. June to September. Both sexes. New records: Elkpoint, South Dakota. Nashville, Tennessee. Gorham, Eldred, Eichorn, Hoopeston and New Canton, Illinois. Baton Rouge, Louisiana. Toquerville and Brigham, Utah. Clifton, Glendale, Phoenix, and Tucson, Arizona. Imperial County, California. Rogers, Arkansas. Lawrence, Kansas. Texas localities of Temple, Crystal City, Carrizo Springs, Brownsville, El Paso (in quarantine station), Waco, Bexar, and Caldwell Counties. Four-mile Run, Virginia. Putman County, Georgia. The list of hosts now include alfalfa, *Andropogon*, clover, cotton, corn, *Malva rotundifolia*, grass, grape, *Panicum obtusum*, partridge pea, peach, turnip, weeds, and in soil. Collection dates extend from April through November. The micropterous form is known from Illinois.
5. *rotundus* Hood, 1949. South America: Brazil. Nova Teutonia, Santa Catharina. *Panicum* sp. January. Both sexes.



6. *septenarius* Hood, 1925. Central America: Trinidad and St. Thomas (B.W.I.). Grass sweeping. Females only. March 29, 1915. New record: La Ceiba, Honduras. July 15, 1949. Flying. E. C. Becker, Coll. This specimen is in the collection of the Illinois Natural History Survey.

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RECORD OF STENOMORPHA CONSOBRINA FROM  
WASHINGTON AND OREGON  
(Coleoptera: Tenebrionidae)

Twenty-seven species of this tenebrionid beetle were given to me by my friend Mr. Samuel Sargent, a geologist employed by the U.S. Engineers at The Dalles, Oregon. They were collected about a mile north of The Dalles, across the Columbia River in the state of Washington, December 15 to 21, 1951. This is a new record of this species for Washington. He also tells me that the beetles are quite common periodically in the area of The Dalles, Oregon, where they are usually found under stones; this is their first recorded occurrence in Oregon.—BORYS MALKIN, *University of Washington, Seattle.*